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EXAMINER

SINGH, DALZID E

ART UNIT	PAPER NUMBER
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2633

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8

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/781,461

Applicant(s)

LICHTMAN ET AL.

Examiner

Dalzid Singh

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 11-14, 17, 21, 24-49, 53-60, 63 and 64 is/are pending in the application.
- 4a) Of the above claim(s) 7-10, 15, 16, 18-20, 22, 23, 50-52, 61, 62 and 65 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 11-14, 17, 21, 24-49, 53-60, 63 and 64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 5, 6, 11, 12, 21, 26, 27, 36, 39 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "said output optical signal" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claims 5, 26 and 39 recite the limitation "the bit-rate". There is insufficient antecedent basis for this limitation in the claim.

Claims 6, 27 and 40 recite the limitation "the protocol". There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "the step of monitoring" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "the step of equalizing the gain" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 21 recites the limitation "said input multi-channel" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 36 recites the limitation "said input multi-channel optical signals" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim Objections

3. In claim 55, applicant recites "...optical multiplexer is operative to generate eight channels corresponding to eight different wavelengths." As shown in Fig. 6 of applicant disclosure, the optical multiplexer (92) receives plurality of channels (1 – M) and produces one optical signal, shown by the arrow, transmitted to NODE #1 (82). Therefore, it is unclear how the optical multiplexer is operative to generate eight channels corresponding to eight different wavelengths. Appropriate correction required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6, 13, 14, 17, 21, 24-27, 30-32, 34, 36-40, 43-45, 47, 49, 63 and 64 are rejected under 35 U.S.C. 102(b) as being anticipated by Fevrier et al (US Patent No. 5,612,805).

Regarding claim 1 (as far as understood), Fevrier et al disclose optical communication, as shown in Fig. 3, comprising:

receiving one or more input optical signals transmitted over said one or more channels of said optical network, each channel potentially corrupted with accumulated noise (as shown in Fig. 3, Fevrier et al show receiving one or more input optical signals

($\lambda_1 \dots \lambda_N$), since the input signals travel on transmission lines, therefore the signal will degrade over time and potentially corrupted with accumulated noise);

filtering said one or more input optical signals as to remove accumulated noise (as shown in Fig. 3, Fevrier et al shows filter ($F_1 - F_N$) to remove accumulated noise); and

outputting said output optical signal onto said one or more channels on said optical network (as shown in Fig. 3, Fevrier et al show outputting said one or more channels ($\lambda'_1 \dots \lambda'_N$).

Regarding claims 2 and 64, as shown in Fig. 3, Fevrier et al show demultiplexing said input optical signal into plurality of optical channels (demultiplexer D1 splits the input signal into plurality of optical channels); and

multiplexing said plurality of individual channels optical channels so as to generate an output optical signal, wherein the multiplexing and demultiplexing function remove accumulated noise from each optical channel (Fevrier et al show multiplexer C1 which multiplexes the plurality of optical channels; since the plurality of optical channels are filtered by filter ($F_1 - F_N$), therefore the accumulated noise in the optical channels are removed).

Regarding claims 3, 24 and 37, as shown in Fig. 3, Fevrier et al show that the demultiplexing is operative to generate a plurality of channels each corresponding to a different wavelength (in col. 5, lines 9-14 and lines 51-60, Fevrier et al teach that the broadcaster or demultiplexer (D1) splits the optical signal into plurality of channels, wherein the channels are filter by the respective filters).

Regarding claims 4, 25 and 38, as shown in Fig. 3, Fevrier et al show that the multiplexing is operative to generate an optical signal from a plurality of channels each corresponding to a different wavelength (in col. 5, lines 25-28, Fevrier et al teach combiner or multiplexer (C1) to multiplex the plurality of optical channels).

Regarding claims 5, 26 and 39 (as far as understood), Fevrier et al do not disclose any bit-rate conversion to convert the bit-rate of the signal, therefore the demultiplexing is operative to be transparent to the bit rate of each individual optical channel.

Regarding claims 6, 27 and 40 (as far as understood), Fevrier et al do not disclose any protocol conversion to convert protocol of the signal, therefore the demultiplexing is operative to be transparent to the protocol of each individual optical channel.

Regarding claim 13, Fevrier et al show enabling and disabling each individual optical channels in response to a corresponding control input (in Fig. 3, Fevrier et al show switch (SW₁) with a control input shown by arrow to the switch, to enable and disable each individual channel, for example, each channel can be pass or dropped, see col. 5, lines 62-67 to col. 6, lines 1-5).

Regarding claims 14, 31 and 44, Fevrier et al discloses wavelength division multiplexing technique (as shown in Fig. 3, Fevrier et al show multiplexer (C1) and demultiplexer (D1) which is a wavelength division multiplexing technique).

Regarding claims 17 and 49, as shown in Fig. 6, Fevrier et al show optical ring network.

Regarding claims 30 and 43, Fevrier et al show optical switch mechanism coupled to each optical channel between said optical demultiplexer and said optical multiplexer, wherein said optical switch mechanism adapted to enable and disable each individual optical channel in response to a corresponding control input (in Fig. 3, Fevrier et al show switch (SW_1) with a control input shown by arrow to the switch, to enable and disable each individual channel, for example, each channel can be pass or dropped, see col. 5, lines 62-67 to col. 6, lines 1-5).

Regarding claims 32 and 45, Fevrier et al show switch means adapted to virtually disconnect one or more optical fiber connecting said optical demultiplexer and optical multiplexer thus shutting off one or more optical channels (in Fig. 3, Fevrier et al show switch (SW_1) with a control input shown by arrow to the switch, to shut off each individual channel, for example, each channel can be pass or dropped, see col. 5, lines 62-67 to col. 6, lines 1-5).

Regarding claims 34 and 47, Fevrier et al disclose means for reducing cross talk placed in series with each optical channel (as shown in Fig. 3, Fevrier et al show filter ($F_1 - F_N$) to filter each optical channels; filtering each optical channel removes noise within that channel; noise within the channel causes spreading and hence produces crosstalk; therefore, filtering the optical channel reduces crosstalk between each channel).

Regarding claim 21 (as far as understood), Fevrier et al disclose optical communication, as shown in Fig. 3, comprising:

an optical demultiplexer operative to demultiplex input optical signals into a plurality of individual optical channels, each of the optical signal having a unique wavelength (as shown in Fig. 3, Fevrier et al show receiving one or more input optical signals ($\lambda_1 \dots \lambda_N$) by demultiplexer (D1) and demultiplexing the signals into plurality of optical signal into unique wavelength, see col. 5, lines 9-10, wherein broadcaster (D1) is a demultiplexer); and,

an optical multiplexer operative to multiplex the plurality of optical channels as to generate output channel (as shown in Fig. 3, Fevrier et al show combiner (C1) to multiplex and output the signals, see col. 5, lines 25-28). Since Fevrier et al disclose filters ($F_1 - F_N$), therefore the accumulated noise is removed).

Regarding claim 36 (as far as understood), Fevrier et al disclose optical communication, as shown in Figs. 3 and 6, comprising:

a plurality of nodes wherein communications between node include a desired signal in addition to undesirable accumulated noise (in Fig. 6, Fevrier et al show plurality of nodes, since the nodes are connected by transmission lines, therefore noise from the transmission lines are accumulated in the desired signal); and,

an optical network terminator for removing accumulated noise in said optical network, wherein said optical network terminator (as shown in Fig. 3, Fevrier et al show optical network terminator of the nodes including filters ($F_1 - F_N$) to remove the accumulated noise) comprises:

an optical demultiplexer operative to demultiplex input optical signals into a plurality of individual optical channels, each of the optical signal having a unique

wavelength (as shown in Fig. 3, Fevrier et al show receiving one or more input optical signals ($\lambda_1 \dots \lambda_N$) by demultiplexer (D1) and demultiplexing the signals into plurality of optical signal into unique wavelength, see col. 5, lines 9-10, wherein broadcaster (D1) is a demultiplexer); and,

an optical multiplexer operative to multiplex the plurality of optical channels as to generate output channel (as shown in Fig. 3, Fevrier et al show combiner (C1) to multiplex and output the signals, see col. 5, lines 25-28). Since Fevrier et al disclose filters ($F_1 - F_N$), therefore the accumulated noise is removed).

Regarding claim 63, Fevrier et al disclose optical communication, as shown in Figs. 3 and 6, comprising:

receiving over a ring an input optical signals containing a single channel and having a wavelength associated therewith (as shown in Fig. 3, Fevrier et al show receiving one or more input optical signals ($\lambda_1 \dots \lambda_N$), the terminal can be connected in a ring as shown in Fig. 6);

filtering said one or more input optical signals as to remove accumulated noise (as shown in Fig. 3, Fevrier et al shows filter ($F_1 - F_N$) to remove accumulated noise); and

generating output optical signal onto from the filtered input signal and outputting the signal onto the ring (as shown in Fig. 3, Fevrier et al show outputting said one or more channels ($\lambda'_1 \dots \lambda'_N$) from the filter ($F_1 - F_N$); since the terminals are connected in a ring, therefore output from one terminal is transmitted onto the ring).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 11, 12, 28, 29, 33, 35, 41, 42, 46, 48, 53-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fevrier et al (US Patent No. 5,612,805) in view of Nishino (US Patent No. 6,594,046).

Regarding claim 53 (as far as understood), Fevrier et al disclose optical communication, as shown in Figs. 3 and 6, comprising:

a plurality of nodes wherein communications between node include a desired signal in addition to undesirable accumulated noise (in Fig. 6, Fevrier et al show plurality of nodes, since the nodes are connected by transmission lines, therefore noise from the transmission lines are accumulated in the desired signal); and,

an optical network terminator for removing accumulated noise in said optical network, wherein said optical network terminator (as shown in Fig. 3, Fevrier et al show optical network terminator of the nodes including filters ($F_1 - F_N$) to remove the accumulated noise) comprises:

an optical demultiplexer operative to demultiplex input optical signals into a plurality of individual optical channels, each of the optical signal having a unique wavelength (as shown in Fig. 3, Fevrier et al show receiving one or more input optical signals ($\lambda_1 \dots \lambda_N$) by demultiplexer (D1) and demultiplexing the signals into plurality of

optical signal into unique wavelength, see col. 5, lines 9-10, wherein broadcaster (D1) is a demultiplexer); and,

an optical multiplexer operative to multiplex the plurality of optical channels as to generate output channel (as shown in Fig. 3, Fevrier et al show combiner (C1) to multiplex and output the signals, see col. 5, lines 25-28). Since Fevrier et al disclose filters ($F_1 - F_N$), therefore the accumulated noise is removed).

Fevrier et al disclose optical communication system as discussed above and differ from the claimed invention in that Fevrier et al do not specifically disclose plurality of optical attenuator and monitors coupled in-line to individual channel and a plurality of monitors to measure and adjust power of the optical signal. In optical communication system, since optical signal degrade as it travels in transmission line, it is well known to provide monitoring units and attenuators to measure the optical power of the optical signal and to adjust optical power by controlling the attenuator respectively. Nishino is cited to show such well known concept (see Fig. 1A and col. 2, lines 31-60). Therefore, it would have been obvious to an artisan of ordinary skill in the art to provide plurality of attenuators and monitors of Nishino to the optical communication system of Fevrier et al. One of ordinary skill in the art would have been motivated to do such in order to maintain optical power at constant level throughout whole wavelength.

Regarding claims 11 (as far as understood), 28 and 41, Fevrier et al disclose optical communication system as discussed above and differ from the claimed invention in that Fevrier et al do not specifically disclose monitor coupled in-line with each optical channel between the multiplexer and demultiplexer to monitor power level of individual

optical channel. In optical communication system, since optical signal degrade as it travels in transmission line, it is well known to provide monitoring units to measure optical power of the optical signal. Nishino is cited to show such well known concept (see Fig. 1A and col. 2, lines 31-60). Therefore, it would have been obvious to an artisan of ordinary skill in the art to provide monitoring circuit of Nishino to the optical communication system of Fevrier et al. One of ordinary skill in the art would have been motivated to do such in order to maintain optical power at constant level throughout whole wavelength.

Regarding claims 12 (as far as understood), 29 and 42, Fevrier et al disclose optical communication system as discussed above and differ from the claimed invention in that Fevrier et al do not specifically disclose equalizer coupled to each optical channel between the multiplexer and demultiplexer to equalize optical gain of individual optical channel. In optical communication system, since optical signal degrade as it travels in transmission line, it is well known to provide equalizer such as attenuators to control and equalize optical power level. Nishino is cited to show such well known concept (see Fig. 1A and col. 2, lines 31-60). Therefore, it would have been obvious to an artisan of ordinary skill in the art to provide equalizer such as attenuators of Nishino to the optical communication system of Fevrier et al. One of ordinary skill in the art would have been motivated to do such in order to maintain optical power at constant level throughout whole wavelength.

Regarding claims 33 and 46, Fevrier et al disclose optical communication system as discussed above and differ from the claimed invention in that Fevrier et al do not

specifically disclose optical attenuator placed in series with each optical channel between the multiplexer and demultiplexer to control power level of individual optical channel. In optical communication system, since optical signal degrade as it travels in transmission line, it is well known to provide attenuators in series with each optical channel in order to control and equalize power level of each optical channel. Nishino is cited to show such well known concept (see Fig. 1A and col. 2, lines 31-60). Therefore, it would have been obvious to an artisan of ordinary skill in the art to provide plurality of attenuators of Nishino to the optical communication system of Fevrier et al. One of ordinary skill in the art would have been motivated to do such in order to maintain optical power at constant level throughout whole wavelength.

Regarding claims 35 and 48, Fevrier et al disclose optical communication system as discussed above and differ from the claimed invention in that Fevrier et al do not specifically disclose gain setting means coupled in-line with each optical channel between the multiplexer and demultiplexer to set the gain of each channel. In optical communication system, since optical signal degrade as it travels in transmission line, it is well known to provide gain setting means such as attenuators in series with each optical channel in order to control and equalize power level of each optical channel. Nishino is cited to show such well known concept (see Fig. 1A and col. 2, lines 31-60). Therefore, it would have been obvious to an artisan of ordinary skill in the art to provide plurality of attenuators of Nishino to the optical communication system of Fevrier et al. One of ordinary skill in the art would have been motivated to do such in order to maintain optical power at constant level throughout whole wavelength.

Regarding claims 54 and 55 (as far as understood), as shown in Fig. 3, Fevrier et al show that the optical demultiplexer is operative to generate multiple channels and the multiple channel in multiplexed to produce a multiplexed optical signal. Fevrier et al differ from the claimed invention in that Fevrier et al do not specifically disclose that the demultiplexer generate eight channels corresponding to eight different wavelength and that the multiplexer multiplexes the eight different channels. However, Fevrier et al show demultiplexer (D1) and multiplexer (C1) capable of generating and multiplexing plurality of optical channels. Based on this teaching it would have been obvious to an artisan of ordinary skill in the art to limit the number of channels that will be generated by the demultiplexer to eight channels. Furthermore, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Swain et al.*, 33 CCPA (Patents) 1250, 156 F.2d 239, 70 USPQ 412; *Minnesota Mining and Mfg. Co. v. Coe*, 69 App D.C. 217, 99 F.2d 986, 38 USPQ 213; *Allen et al. v. Coe*, 77 App D.C. 324, 135 F.2d 11, 57 USPQ 136. In addition, discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Antonie*, 559 F.2d 239, 618, 195 USPQ 6 (CCPA 1977); *In re Aller*, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). See also *In re Aller*, 105 USPQ 233 (CCPA 1955) and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to set the number of channels to an optimum or workable value or range by routine experimentation.

Regarding claim 56 (as far as understood), Fevrier et al do not disclose any bit-rate conversion to convert the bit-rate of the signal, therefore the demultiplexing is operative to be transparent to the bit rate of each individual optical channel.

Regarding claim 57 (as far as understood), Fevrier et al do not disclose any protocol conversion to convert protocol of the signal, therefore the demultiplexing is operative to be transparent to the protocol of each individual optical channel.

Regarding claim 58, Fevrier et al show enabling and disabling each individual optical channels in response to a corresponding control input (in Fig. 3, Fevrier et al show switch (SW₁) with a control input shown by arrow to the switch, to enable and disable each individual channel, for example, each channel can be pass or dropped, see col. 5, lines 62-67 to col. 6, lines 1-5).

Regarding claim 59, the combination of Fevrier et al and Nishino discloses equalizing the gain of each individual optical channel (gain of individual channel is equalized by adjusting the attenuator as shown by Nishino).

Regarding claim 60, the combination of Fevrier et al and Nishino discloses monitoring the power level of each individual channel.

Response to Arguments

8. Applicant's arguments with respect to claims 1-64 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is 703-306-5619. The examiner can normally be reached on Mon-Fri 8am - 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DS
May 28, 2004

Dalzid Singh